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ABSTRACT

This paper suggests the need for a broader conceptualization of both instructional design and of instructional design theory, suggesting that this broader view is necessary to establish a truly comprehensive and functional theory base. Theories come in many forms: they can be formal systems of laws and propositions, narrative explanations and predictions, or models which are either verbal, visual or mathematical. The parameters established for design impact the nature and scope of the corresponding design theory; some see design as a planning process while others include content selection and instructional management. The author distinguishes between macro-design models and theory (Instructional Systems Design models describing the entire design project) and micro-design models and theory (lesson design models). Macro-design primarily reflects the primary influence of psychological, instructional, communications and audio-visual theory. Problems in balancing the two may not be so much conflicting definitions of instructional design, but rather conflicting conceptions of the design knowledge base. (Contains 24 references.) (AEF)

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The Dimensions and Impact of Alternative Views of Theory and Instructional Design

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The domain of instructional design has always been rooted in research and theory, initially originating from those of other disciplines. As the instructional design field matures, the bulk of current design research is now being conducted within our own intellectual framework and addresses our own questions more directly. Moreover, most feel that the Design Domain is the most theoretically mature domain of the field of Instructional Technology. In spite of this, some are arguing that not only the validity of the design theory base is questionable, but more basically they are questioning whether we have formal theory at all. Some note the preponderance of "theory" suggested originally as an application of foundational research in other disciplines, but still not validated with design-related research. As such, the field is often in a position of accepting *hypothesized* theory as established theory. This same dilemma exists with respect to many of the instructional design procedural models. The models have been devised based upon practical experience and a synthesis and an application of other foundational theory. But many still lack empirical support and validation in their own right (Gustafson, 1991).

At the heart of these discussions is the lack of fundamental agreement as to the nature and function of instructional design theory. Should design theory be descriptive, prescriptive, or predictive? What foci are appropriate for design theory? The design process? The instructional process? Factors that impact instruction and learning? Factors that impact designer decision making? It is interesting that these conflicts pertain to instructional design, supposedly the most theoretically "sophisticated" facet of our field.

The answers to these questions depend not so much on one's position as to what is good theory or bad, nor to the relative merits of positivism or post-Aristotelian thinking (to use the Jonassen, et.al., 1997 dichotomy). To a greater extent the discussions seem to hinge upon one's basic definitions of "theory" and "instructional design" themselves. This paper will address these two notions, as well as the connections between the two. Fundamentally, I am arguing for a broader conceptualization of both instructional design and of instructional design theory than is often typical. I am suggesting that this broader view of both theory and discipline is necessary to establish a truly comprehensive and functional theory base.

The Definition of "Theory"

Theory has been defined in its most traditional sense as "a set of related propositions that attempts to explain, and sometimes predict, a set of events" (Hoover, 1992, p.66). An alternative, but not totally unrelated, definition suggests a theory is constituted in terms of "two or more variables linked by rule and a set of limiting conditions" (Meehan, 1994, p. 115). Others have identified various types and levels of theory which vary in terms of format and formality. (See Richey, 1986, for a more detailed discussion.) Theories come in many forms, and have varying degrees of robustness. They can be formal systems of laws and propositions. They can be narrative explanations and predictions. They can be models which are either verbal, visual, or mathematical.

Systems of Laws. Theories formally constructed as systems of law are the most traditional theory format, and at the same time the rarest theory form in Instructional Technology. However, the term "theory", used in this sense, can take many forms short of being a full-fledged system of laws. It can take the form of an organization and summary of existing knowledge (Littlejohn, 1978). It can take the form of a hypothesis (even an initial and unsubstantiated hypothesis), or the form of a set of related propositions (Snow, 1973). These "theories" are built around suggested relationships among variables which have been established through research. Systems of laws have goals of both describing and, ultimately, predicting events.

Formal theoretical systems to a great extent are missing from the design literature. This reflects current trends in theory construction as well as the lack of support for replicated, basic research in our field. Nonetheless, there have been some attempts (Merrill, 1994; Richey, 1992). However, one can characterize much design-related research as attempts to describe key variables and their relationships to each other. These studies are, by and large, attempting to establish fact. Even though frequently such research is not designed as a step in systematic theory building, it can be synthesized and used to develop hypotheses.

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Narrative Explanations. Theory can also take the form of a narrative description of events. While systems of laws tend to be based upon quantitative research, narrative explanations (in this case, explanations of the critical design processes and their outcomes) are more often based upon qualitative research. This type of theory has been described as being the "mirrors of man" and is developed so that we can see ourselves better (Kluckhohn, as noted in Diesing, 1991). These narrative explanations create a knowledge base by providing "descriptions, from the inside, of a way of life, community, person, belief system, or scientific community's beliefs (Diesing, 1991, p. 325)" and serve as models of dynamic processes of a field.

There is a new body of research in our field relating to designer decision-making and problem solving. This research has the potential of developing into theory of the type as described by Diesing. Much of this research is qualitative (Nelson, 1990; Rowland, 1992), and its primary goal is to understand the process of instructional design and the nature of design thinking. This research describes and explains factors such as the instructional design task environment (Goel & Pirolli, 1988; Kerr, 1983), and the cognitive process of instructional design (Akin, Chen, Dave, & Pithavadian, 1986). This body of literature is leading to the development of new theoretical constructs (e.g. designer thinking, design task environment), and can be viewed as elements of narrative theory construction.

Postmodern criticism or theorizing can also "fit" into this category of theory. Interpretation from unique perspectives without concern for generalizability, or reflection on the essence of meaning can result in a narrative description of complex issues (see Wilson, 1997).

Models. The third form of theory relates to models of dynamic processes and procedures. Such models can be conceptual or procedural in nature. Even though there is a historical precedent for such theory to arise from basic research, it is not essential. Theories can be rooted in applied research conducted in real-life settings.

For many, the design procedural models form the core of design theory. Dick (1997) cites the role of models as "representations of theory", and notes that they serve as techniques for summarizing the research and procedures of our field, and of visualizing a succession of "if-then" statements. They can be easily supported by both evaluation research and developmental research.

Most design procedural models are variations of the traditional Instructional Systems Design (ISD) models (see Dick and Carey, 1996). However, there are also design models that provide a structure for instructional strategy selection and sequencing as Gagne's Events of Instruction (Gagne, 1985) or Reigeluth's (1983) Elaboration Theory. We also have non-procedural design models that shape our thinking as well. These are conceptual models. Seels (1997) describes a number of these models in her analysis of design-related taxonomies, including Dale's Cone of Experiences, the learning task classifications, and Clark's Taxonomy of Media Attributes.

The Scope of Instructional Design

There have been a number of different definitions of instructional design with most highlighting design as a *planning* process (Briggs, 1977; Richey, 1986; Seels and Richey, 1994). However, there are those who emphasize only the planning in terms of instruction and instructional methods (Reigeluth, 1983), as opposed to the more comprehensive activity that also includes, for example, content selection, planning for assessment and evaluation, and instructional management. Clearly, the parameters established for design itself impact the nature and scope of the corresponding design theory. Much of this confusion may stem from the early history of instructional design when the more common term used was "instructional science.".

I have previously separated these two points-of-view (Richey, 1993, 1995) by distinguishing between macro-design models and theory (i.e. ISD models describing the entire design project) and micro-design models and theory (i.e. lesson design models). While I see these all as instructional design models, the distinction does reflect design's different intellectual roots and foundations. Macro-design primarily reflects the influence of general systems, curriculum, and management theory. On the other hand, micro-design reflects the primary influence of psychological, instructional, communications and audio-visual theory.

Ragan and Smith (1996) have somewhat avoided the design definition dilemma by using the more precise terms "conditions-based theory" and "conditions-based instructional design models". Such terminology clearly reflects the influence of Robert Gagne, as well as the psychological and instructional theory foundations of design. It also fairly precisely categorizes a large segment of design theory.

It may be that there are other design theory genres that also provide alternative views of instructional design. For example, there are portrayals of design as a problem solving/decision-making/reflection activity, or as a scientific engineering activity, or as a performance improvement activity. There are also genres of design theory that reflect varying philosophical points of view, such as constructivism or post-modernism.

Thus, the problem may not be so much one of conflicting *definitions* of instructional design, but rather one of conflicting conceptions of the design knowledge base. It may be a classic case of assuming the part one understands or gives credence to is actually the whole. It seems that progress in this field of study is dependent to a great extent upon accommodating a comprehensive view of instructional design. This more inclusive scope not only lends credence to theory addressing a wider range of topics, but also facilitates theory constructed in alternative formats and alternative intellectual orientations as well.

Instructional Design Theory: Dream or Reality?

The question then is whether that which we call design theory is truly theory and whether it truly represents the field of instructional design. Typically, theory is judged in terms of its accuracy, validity, and its utility. The additional element introduced here pertains to the comprehensiveness of the body of design theory as a whole. Topical breadth is a function of both the prevailing views of the nature of instructional design as well as the prominent issues that are currently attracting attention (Richey, 1997). Breadth of theoretical format is to some extent is a function of the same factors. However, there has been a narrowly defined view of theory in the history of instructional design. This tradition tends to recognize theory primarily in terms of either: 1) ISD models or 2) specifications of rules for instructional strategy selection and sequencing. In spite of the many contributions such theory has made to the field, the continuation of this somewhat narrow intellectual framework can pose serious problems for the field. Accuracy can be doubted because of a perceived lack of relevance. Relevance can be sacrificed because of topical provincialism. Validity can be threatened by methodological stagnation. Ultimately, such events can result in the utility of our instructional design theories being generally ignored by all except the theorists themselves.

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